

**CPC****COOPERATIVE PATENT CLASSIFICATION****G01T**

**MEASUREMENT OF NUCLEAR OR X-RADIATION** (radiation analysis of materials, mass spectrometry G01N; counters per se G06M, H03K; electric discharge tubes for analysing radiation or particles [H01J 40/00](#), [H01J 47/00](#), [H01J 49/00](#))

**NOTE**

This subclass covers the measurement of X-radiation, gamma radiation, corpuscular radiation, cosmic radiation or neutron radiation.

Attention is drawn to the Notes following the title of class G01.

**G01T 1/00**

**Measuring X-radiation, gamma radiation, corpuscular radiation, or cosmic radiation** ([G01T 3/00](#), [G01T 5/00](#) take precedence)

## G01T 1/003

. {Scintillation (flow) cells}

## G01T 1/006

. {Total absorption calorimeters; Shower detectors}

## G01T 1/02

. Dosimeters ([G01T 1/15](#) takes precedence, measuring exposure time to X-rays [H05G 1/28](#))

## G01T 1/023

.. {Scintillation dose-rate meters}

## G01T 1/026

.. {Semiconductor dose-rate meters}

## G01T 1/04

.. Chemical dosimeters ([G01T 1/06](#), [G01T 1/08](#) take precedence)

## G01T 1/06

.. Glass dosimeters {using colour change; including plastic dosimeters}

## G01T 1/08

.. Photographic dosimeters (sensitive materials, processing thereof [G03C](#); {photometry [G01J 1/52](#)})

## G01T 1/10

.. Luminescent dosimeters

## G01T 1/105

... Read-out devices ([G01T 1/115](#) takes precedence)

## G01T 1/11

... Thermo-luminescent dosimeters {(thermo-luminescent compositions [C09K 11/00](#))}

## G01T 1/115

.... Read-out devices

## G01T 1/12

.. Calorimetric dosimeters

## G01T 1/14

.. Electrostatic dosimeters (construction of ionisation chambers [H01J 47/02](#); {electrometers [G01R 5/28](#)})

## G01T 1/142

... Charging devices; Read-out devices

## G01T 1/15

. Instruments in which pulses generated by a radiation detector are integrated, e.g. by a diode pump circuit (pulse rate meters in general [G01R 23/02](#))

## G01T 1/16

. Measuring radiation intensity ([G01T 1/29](#) takes precedence; {self-powered detectors [G01T 3/006](#); using an ionisation chamber filled with a liquid or solid, e.g. frozen liquid, dielectric [G01T 3/008](#)})

- G01T 1/1603 .. {with a combination of at least two different types of detector (see provisionally also [G01T 1/16](#))}
- G01T 1/1606 .. {with other specified detectors not provided for in the other sub-groups of [G01T 1/16](#)(see provisionally also [G01T 1/16](#))}
- G01T 1/161 .. Application in the field of nuclear medicine, e.g. in vivo counting {(apparatus for radiation diagnosis [A61B 6/00](#))}
- G01T 1/1611 ... { using both transmission and emission sources sequentially (SPECT imaging [G01T 1/1642](#); PET imaging [G01T 1/2985](#); detecting hidden objects, e.g. weapons, explosives [G01V 5/00D](#))}
- G01T 1/1612 ..... { with scintillation detectors ([G01T 1/20](#) takes precedence)}
- G01T 1/1614 ..... { with semiconductor detectors ([G01T 1/24](#) takes precedence)}
- G01T 1/1615 ... { using both transmission and emission sources simultaneously (SPECT imaging [G01T 1/1642](#); PET imaging [G01T 1/2985](#); detecting hidden objects, e.g. weapons, explosives [G01V 5/00D](#))}
- G01T 1/1617 ..... { with scintillation detectors ([G01T 1/20](#) takes precedence)}
- G01T 1/1618 ..... { with semiconductor detectors ([G01T 1/24](#) takes precedence)}
- G01T 1/163 ... Whole body counters { hand or feet contamination measurement [G01T 1/167](#); lung, brain, thyroid, kidney or the like counting [G01T 1/16](#)}
- G01T 1/1635 ..... {involving relative movement between detector and subject; scanning beds (profile scanning [G01T 1/166](#); positioning patients, tiltable tables for radiation diagnosis [A61B 6/04](#))}
- G01T 1/164 ... Scintigraphy (radioisotopes [G21G 4/00](#); tracers [G21H 5/00](#); {measurement of spatial distribution [G01T 1/2914](#); apparatus for radiation diagnosis in different planes [A61B 6/02](#))}
- G01T 1/1641 ..... { Static instruments for imaging the distribution of radioactivity in one or two dimensions using one or several scintillating elements; Radio-isotope cameras}
- G01T 1/1642 ..... {using a scintillation crystal and position sensing photodetector arrays, e.g. ANGER cameras}
- G01T 1/1644 ..... {using an array of optically separate scintillation elements permitting direct location of scintillations ([G01T 1/1645](#) takes precedence)}
- G01T 1/1645 ..... {using electron optical imaging means, e.g. image intensifier tubes, coordinate photomultiplier tubes, image converter}
- G01T 1/1647 ..... {Processing of scintigraphic data (not related to a particular imaging system [G01T 1/2992](#); special purpose computers for nuclear physics [G06F 15/52](#))}
- G01T 1/1648 ..... {Ancillary equipment for scintillation cameras e.g. reference markers, devices for removing motion artifacts, calibration devices (adapted for flow studies [G01T 1/1647](#))}
- G01T 1/166 ..... involving relative movement between detector and subject ({scanners in general without using scintigraphy [G01T 1/2964](#))}
- G01T 1/1663 ..... {Processing methods of scan data, e.g. involving contrast enhancement, background reduction, smoothing, motion correction, dual radio-isotope scanning, computer processing (for measuring spatial distribution of radiation [G01T 1/2992](#); digital computing or data processing equipment or methods specially adapted for nuclear physics or nuclear engineering [G06F 15/52](#), e.g. for image data processing [G06F 15/52D](#); general purpose image data processing [G06T 1/00](#); computerized tomography [G06T 11/003](#)); Ancillary equipment (colour printers [G01T 1/1666](#))}
- G01T 1/1666 ..... {adapted for printing different symbols or colours according to the intensity or energy level of the detected radioactivity (depth

- discrimination in colour [G01T 1/2985](#)})
- G01T 1/167 .. Measuring radioactive content of objects, e.g. contamination (whole body counters [G01T 1/163](#))
- G01T 1/169 .. Exploration, location of contaminated surface areas (prospecting by the use of nuclear radiation e.g. of natural or induced radioactivity [G01V 5/00](#)){in situ measurement, e.g. floor contamination monitor (directional detectors [G01T 1/2907](#))}
- G01T 1/17 .. Circuit arrangements not adapted to a particular type of detector {(pulse-selection circuits [H03K](#), [G01R](#))}
- G01T 1/171 ... {Compensation of dead-time counting losses (see provisionally also 1/17)}
- G01T 1/172 ... with coincidence circuit arrangements ([G01T 1/178](#) takes precedence; {combination of detectors, see [G01T 1/1603](#), [G01T 1/30](#), [G01T 1/361](#), [G01T 1/36D2](#), [G01T 1/36D3](#)})
- G01T 1/175 ... Power supply circuits (power supply circuits per se [H02J](#); converters [H02M](#))
- G01T 1/178 ... for measuring specific activity in the presence of other radioactive substances, e.g. natural, in the air or in liquids such as rain water
- G01T 1/18 .. with counting-tube arrangements, e.g. with Geiger counters(tubes[H01J 47/08](#)){with alarm provision[G01T 7/125](#)})
- G01T 1/185 .. with ionisation chamber arrangements (construction of ionisation chambers [H01J 47/02](#); { gas analysis by ionisation [G01N 27/66](#); measuring pressure [G01L 9/00](#); leak detection [G01M 3/00](#); tele-measurements [G08C](#)})
- G01T 1/20 .. with scintillation detectors
- G01T 1/2002 ... {Optical details, e.g. reflecting or diffusing layers}
- G01T 1/2004 ... {Scintilloscopes (fluoroscopes [G21K 4/00](#); radiation diagnosis [A61B 6/00](#))}
- G01T 1/2006 ... {using a combination of a scintillator and photodetector which measures the means radiation intensity}
- G01T 1/2008 ... { using a combination of different types of scintillation detectors, e.g. phoswich}
- WARNING**
- [G01T 1/20](#)
- G01T 1/201 ... [N : using scintillating fibres]
- WARNING**
- [G01T 1/2992](#)
- G01T 1/2012 ... [N : using stimuable phosphors, e.g. stimuable phosphor sheets]
- WARNING**
- [G01T 1/2992](#)
- G01T 1/2014 .... { Reading out of stimuable sheets, e.g. latent image}
- G01T 1/2016 .... [N : Erasing of stimuable sheets, e.g. with light, heat or the like]
- G01T 1/2018 ... {Scintillation-photodiode combination}
- G01T 1/202 ... the detector being a crystal
- G01T 1/2023 .... {Selection of materials (see provisionally also [G01T 1/202](#))}
- G01T 1/2026 .... {Well-type detectors (see provisionally also [G01T 1/202](#))}

- G01T 1/203 . . . the detector being made of plastics
- G01T 1/2033 . . . . {Selection of materials (see provisionally also [G01T 1/203](#))}
- G01T 1/2036 . . . . {Well-type detectors (see provisionally also [G01T 1/203](#))}
- G01T 1/204 . . . the detector being a liquid
- G01T 1/2042 . . . . {Composition for liquid scintillation systems}
- G01T 1/2045 . . . . . {Liquid scintillation quench systems}
- G01T 1/2047 . . . . . {Sample preparation}
- G01T 1/205 . . . the detector being a gas
- G01T 1/208 . . . Circuits specially adapted for scintillation detectors, e.g. for the photo-multiplier section
  
- G01T 1/22 . . with Cerenkov detectors
- G01T 1/24 . . with semiconductor detectors ([semiconductor devices per se H01L 31/00](#))
- G01T 1/241 . . . { Electrode arrangements, e.g. continuous or parallel strips or the like (constructional or manufacturing details [H01L 31/00](#))}
- G01T 1/242 . . . [N : Stacked detectors, e.g. for depth information (constructional or manufacturing details [H01L 25/00](#))]
- G01T 1/243 . . . { Modular detectors, e.g. arrays formed from self contained units (constructional or manufacturing details [H01L 25/00](#))}
- G01T 1/244 . . . { Auxiliary details, e.g. casings, cooling, damping or insulation against damage by e.g. heat, pressure or the like}
- G01T 1/245 . . . { using memory cells}
- G01T 1/246 . . . { utilizing latent read-out, e.g. charge stored and read-out later}
- G01T 1/247 . . . { Detector read-out circuitry (for processing gain or off-set correction [H04N](#))}
- G01T 1/248 . . . { Silicon photomultipliers [SiPM], e.g. an avalanche photodiode [APD] array on a common Si substrate}
- G01T 1/249 . . . { specially adapted for use in SPECT or PET (SPECT imaging [G01T 1/1642](#); PET imaging [G01T 1/2985](#); detecting hidden objects, e.g. weapons, explosives [G01V 5/00D](#))}
- G01T 1/26 . . with resistance detectors {(photoresistors [H01L 31/00](#))}
- G01T 1/28 . . with secondary-emission detectors ([secondary-electron-emitting electrodes in general H01J 1/32](#)){optionally combined with scintillation counters (secondary emission tubes [H01J 43/00](#))}
  
- G01T 1/29 . . Measurement performed on radiation beams, e.g. position or section of the beam; Measurement of spatial distribution of radiation([scintigraphy G01T 1/164](#); [mass-spectrometers H01J 49/025](#))
- G01T 1/2907 . . {Angle determination; Directional detectors; Telescopes (prospecting by the use of nuclear radiation, e.g. of natural or induced radioactivity [G01V 5/00](#))}
- G01T 1/2914 . . {Measurement of spatial distribution of radiation}
- G01T 1/2921 . . . {Static instruments for imaging the distribution of radioactivity in one or two dimensions; Radio-isotope cameras (using scintigraphy [G01T 1/1641](#))}
- G01T 1/2928 . . . . {using solid state detectors}
- G01T 1/2935 . . . . {using ionisation detectors}
- G01T 1/2942 . . . . {using autoradiographic methods}
- G01T 1/295 . . . . {using coded aperture devices e.g. Fresnel zone plates (handling of radiation of particles e.g. using diaphragms, collimators, diffraction [G21K 1/00](#))}

- G01T 1/2957 . . . . {using channel multiplier arrays (channel multipliers [H01J 43/18](#); [G01T 1/1645](#) takes precedence)}
- G01T 1/2964 . . . {Scanners (using scintigraphy [G01T 1/166](#))}
- G01T 1/2971 . . . . {using solid state detectors}
- G01T 1/2978 . . . {Hybrid imaging systems, e.g. using a position sensitive detector (camera) to determine the distribution in one direction and using mechanical movement of the detector or the subject in the other direction or using a camera to determine the distribution in two dimensions and using movement of the camera or the subject to increase the field of view ([G01T 1/2985](#) takes precedence)}
- G01T 1/2985 . . . {In depth localisation e.g. using positron emitters; Tomographic imaging (longitudinal and transverse section imaging; apparatus for radiation diagnosis sequentially in different planes, stereoscopic radiation diagnosis); (using external radiation sources [A61B 6/02](#))}
- G01T 1/2992 . . . {Radioisotope data or image processing not related to a particular imaging system; Off-line processing of pictures, e.g. rescanners (for measuring radiation intensity [G01T 1/1663](#); digital computing or data processing equipment or methods specially adapted for nuclear physics or nuclear engineering **G06F 15/52**, e.g. for image data processing **G06F 15/52D**; general purpose image data processing [G06T 1/00](#); computerized tomography [G06T 11/003](#))}
- G01T 1/30 . Measuring half-life of a radioactive substance {(period meters for nuclear fission reactors [G21C 17/14](#))}
- G01T 1/32 . Measuring polarisation of particles
- G01T 1/34 . Measuring cross-section, e.g. absorption cross-section of particles
- G01T 1/36 . Measuring spectral distribution of X-rays or of nuclear radiation {spectrometry (pulse selection circuits per se [H03K](#); investigation of materials by radiation diffraction [G01N 23/20](#); spectrometer tubes [H01J 49/00](#))}
- G01T 1/361 . . {with a combination of detectors of different types, e.g. anti-Compton spectrometers (intensity measurement with a combination of detectors [G01T 1/1603](#); with coincidence circuit [G01T 1/172](#); see provisionally also [G01T 1/36](#))}
- NOTE**
- [G01T 1/361](#) takes precedence over [G01T 1/362](#)
- G01T 1/362 . . {with scintillation detectors (see provisionally also [G01T 1/36](#), [G01T 1/20](#))}
- G01T 1/363 . . {with Cerenkov detectors}
- G01T 1/365 . . {with ionisation detectors e.g. proportional counter (see provisionally also [G01T 1/36](#))}
- G01T 1/366 . . {with semi-conductor detectors (see provisionally also [G01T 1/36](#))}
- G01T 1/367 . . {with resistance detectors (see provisionally also [G01T 1/36](#))}
- G01T 1/368 . . {with secondary-emission detectors (see provisionally [G01T 1/36](#))}
- G01T 1/38 . . Particle discrimination and measurement of relative mass, e.g. by measurement of loss of energy with distance (dE/dx) {(constructional details of semiconductor detectors therefor [H01L 31/00](#))}
- G01T 1/40 . . Stabilisation of spectrometers {(circuits specially adapted for scintillation detectors [G01T 1/208](#))}

- G01T 3/00**      **Measuring neutron radiation** ([G01T 5/00](#) takes precedence; {tubes therefor [H01J 47/12](#); circuits with such tubes [G01T 1/18](#); measuring short time intervals [G04F 10/00](#); measuring pulse characteristics [G01R 29/02](#); neutron choppers [G21K 1/04](#); polarimeters [G01T 1/32](#)})
- [G01T 3/001](#)      . {Spectrometry (see provisionally also [G01T 1/36](#) to [G01T 1/368](#) -except **G01T 1/36D3-**, [G01T 3/00](#); other sub-groups of [G01T 3/00](#) take precedence)}
- [G01T 3/003](#)      .. {Recoil spectrometers (light-nuclei recoil ionisation tubes per se [H01J 47/1277](#))}
- [G01T 3/005](#)      .. {Time-of-flight spectrometers (see provisionally also [G01T 3/00](#))}
- [G01T 3/006](#)      . {using self-powered detectors (for neutrons as well as for Y- or X-rays), e.g. using Compton-effect (Compton diodes) or photo-emission or a (n,B) nuclear reaction (photovoltaic semiconductors [H01L 31/00](#); photo-tubes [H01J 40/00](#); thermionic generators [H01J 45/00](#); radioisotopic generators [G21H 1/00](#), e.g. [G21H 1/02](#), [G21H 1/04](#))}
- [G01T 3/008](#)      . { using an ionisation chamber filled with a gas, liquid or solid, e.g. frozen liquid, dielectric ([G01T 3/006](#) takes precedence)}
- [G01T 3/02](#)      . by shielding other radiation
- [G01T 3/04](#)      . using calorimetric devices
- [G01T 3/06](#)      . with scintillation detectors
- [G01T 3/065](#)      .. {Spectrometry}
- [G01T 3/08](#)      . with semiconductor detectors (semiconductor detectors per se [H01L 31/00](#))
- [G01T 3/085](#)      .. {Spectrometry}
- G01T 5/00**      **Recording of movements or tracks of particles** (spark chambers [H01J 47/00](#));  
**Processing or analysis of such tracks**
- [G01T 5/002](#)      . {using a combination of several movement of track recording devices (detectors associated with recording chambers and only serving to trigger these chambers, see the appropriate groups of the chamber e.g. [G01T 5/04](#) - [G01T 5/08](#); see provisionally also [G01T 5/00](#) and other sub-groups)}
- [G01T 5/004](#)      . {Non-electrical readout of multi-wire or parallel-plate chambers (non-electrical readout in such chambers per se [H01J 47/22](#))}
- [G01T 5/006](#)      .. {by optical methods}
- [G01T 5/008](#)      .. {by acoustical methods}
- [G01T 5/02](#)      . Processing of tracks; Analysis of tracks {(special purpose computers for nuclear physics **G06F 15/52**)}
- [G01T 5/04](#)      . Cloud chambers, e.g. Wilson chamber
- [G01T 5/06](#)      . Bubble chambers
- [G01T 5/08](#)      . Scintillation chambers (discharge tubes [H01J 40/00](#), [H01J 47/00](#); semiconductor

devices [H01L](#))

- G01T 5/10 . Plates or blocks in which tracks or nuclear particles are made visible by after-treatment, e.g. using photographic emulsion, using mica
- G01T 5/12 . Circuit arrangements with multi-wire or parallel-plate chambers, e.g. spark chambers (tubes per se [H01J 47/00](#))
- G01T 5/122 .. {for readout of each individual wires; (readout in such chambers per se [H01J 47/16](#)); for processing the output signals}
- G01T 5/125 ... {by using delay lines}
- G01T 5/127 .... {by using magnetostrictive delay lines}

### **G01T 7/00**      **Details of radiation-measuring instruments**

- G01T 7/005 . { calibration techniques (stabilization of spectrometer [G01T 1/40](#))}
- G01T 7/02 . Collecting means for receiving or storing samples to be investigated {and possibly directly transporting the samples to the measuring arrangement; particularly for investigating radioactive fluids (sampling, preparing specimens for investigation in general [G01N 1/00](#), [G01N 1/02](#); shielded cells or rooms structurally combined with manipulative devices [G21F](#); measuring of chromatographically separated samples [G01N 30/00](#) to [G01N 30/96](#))}
- G01T 7/04 .. by filtration
- G01T 7/06 .. by electrostatic precipitation ([G01T 7/04](#) takes precedence)
- G01T 7/08 . Means for conveying samples received {(i.e. sample changers [G01N 35/00](#))}
- G01T 7/10 .. using turntables
- G01T 7/12 . Provision for actuation of an alarm
- G01T 7/125 .. {Alarm- or controlling circuits using ionisation chambers, proportional counters or Geiger-Mueller tubes, also functioning as UV detectors (measuring radiation intensity with counting tubes [G01T 1/18](#); measuring radiation intensity with ionisation chambers [G01T 1/185](#); fire alarms actuated by presence of radiation of particles, e.g. of infra-red radiation, of ions **G08B 7/12**; flame monitoring in combustion devices [F23Q 7/00](#), [F23N](#); discharge tubes per se [H01J 47/00](#))}